This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): A voltage supplying device comprising:

a reference voltage generating circuit having a ladder resistance circuit to which a plurality of resisters are connected in series, which outputs a plurality of voltages divided in the ladder resistance circuit as a plurality of gamma-corrected reference voltages;

a plurality of first impedance conversion circuits which performs impedance conversion on the plurality of reference voltages from the reference voltage generating circuit and outputs the converted voltages;

a voltage selection circuit having a plurality of analogue switches one of which is turned on based on grayscale data, which selects one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

a second impedance conversion circuit which performs impedance conversion on a voltage from the voltage selection circuit and outputs the converted voltage;

a first switching element for blocking an output of the second impedance conversion circuit;

a first bypass line for shorting input and output lines of the second impedance conversion circuit;

a second switching element provided on the first bypass line;

a plurality of third switching elements for blocking an output of the plurality of first impedance conversion circuits;

a plurality of second bypass lines for shorting input and output lines of the respective plurality of first impedance conversion circuits; and

a plurality of fourth switching elements provided on the respective plurality of second bypass lines,

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wherein the first switching element is turned on and the second switching element is turned off in a first period of a charging period, and the first switching element is turned off and the second switching element is turned on in a second period of the charging period which follows after the first period; and

wherein the plurality of third switching elements are turned off and the plurality of fourth switching elements are turned on at least in a final stage of the second period, and the plurality of third switching elements are turned on and the plurality of fourth switching elements are turned off in the other periods of the charging period.

2. (Original): The voltage supplying device as defined in claim 1,

wherein the plurality of third switching elements are turned off and the plurality of fourth switching elements are turned on throughout the second period.

3. (Original): The voltage supplying device as defined in claim 1,

further comprising a fifth switching element connected to a power supply line which supplies a power source voltage to the plurality of first impedance conversion circuits,

wherein the fifth switching circuit is turned off in synchronization with an off operation of the third switching element.

4. (Original): The voltage supplying device as defined in claim 3,

wherein the plurality of third switching elements are turned off and the plurality of fourth switching element are turned on before the second period starts.

5. (Original): The voltage supplying device as defined in claim 1,

wherein there is a period in which both the first and the second switching elements are turned off.

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6. (Original): The voltage supplying device as defined in claim 1, further comprising a sixth switching element connected on a power source line which supplies a power source voltage to the second impedance conversion circuit,

wherein the sixth switching element is turned off in synchronization with an off operation of the first switching element.

7. (Original): The voltage supplying device as defined in claim 1,

wherein the second impedance conversion circuit is formed of a voltage follower circuit;

wherein when an input voltage having a magnitude near a power source potential VDD is input to the voltage follower circuit, the voltage follower circuit has a property in which an output voltage is saturated and shows no linear characteristics in response to the input voltage; and

wherein a voltage from the voltage supplying source is supplied to the load capacitance through the first bypass line by turning off the first switching element and turning on the second switching element in a saturated region of an output voltage of the voltage follower circuit.

8. (Original): The voltage supplying device as defined in claim 1,

wherein the second impedance conversion circuit is formed of a voltage follower circuit;

wherein when an input voltage having a magnitude near a ground potential VEE is input to the voltage follower circuit, the voltage follower circuit has a property in which an output voltage is saturated and shows no linear characteristics in response to an input voltage; and

wherein a voltage from the voltage supplying source is supplied to the load capacitance through the first bypass line by turning off the first switching element and turning off the second switching element in a saturated region of an output voltage of the voltage follower circuit.

9. (Original): A semiconductor device comprising the voltage supplying device as defined in claim 1.

10. (Original): An electro-optical device comprising:

a display section having an electro-optical element; and

a driver IC for driving a signal line of the display section,

wherein the driver IC comprises a voltage supplying device which supplies a voltage to a load capacitance to finish charging the load capacitance with a predetermined voltage within a predetermined charging period; and

wherein the voltage supplying device comprises:

a reference voltage generating circuit having a ladder resistance circuit to which a plurality of resisters are connected in series, which outputs a plurality of voltages divided in the ladder resistance circuit as a plurality of gamma-corrected reference voltages;

a plurality of first impedance conversion circuits which perform impedance conversion on the plurality of reference voltages from the reference voltage generating circuit and output the converted voltages;

a voltage selection circuit having a plurality of analogue switches one of which is turned on based on grayscale data, which selects one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

a second impedance conversion circuit which performs impedance conversion on a voltage from the voltage selection circuit and outputs the converted voltage;

a first switching element for blocking an output of the second impedance conversion circuit;

a first bypass line for shorting input and output lines of the second impedance conversion circuit;

a second switching element provided on the first bypass line;

a plurality of third switching elements for blocking an output of the plurality of first impedance conversion circuits;

a plurality of second bypass lines for shorting input and output lines of the respective plurality of first impedance conversion circuits; and

a plurality of fourth switching elements provided on the respective plurality of second bypass lines,

wherein the first switching element is turned on and the second switching element is turned off in the first period of the charging period, and the first switching element is turned off and the second switching element is turned on in the second period of the charging period which follows after the first period; and

wherein the plurality of third switching elements are turned off and the plurality of fourth switching elements are turned on at least in a final stage of the second period, and the plurality of third switching elements are turned on and the plurality of fourth switching elements are turned off in the other periods of the charging period.

11. (Original): The electro-optical device as defined in claim 10,

wherein the electro-optical element is driven based on grayscale voltages from the voltage supplying device;

wherein the voltage selection circuit is formed of a digital-analogue converter which converts a digital grayscale signal to an analogueue voltage; and

wherein the first period of the charging period is finished after the load capacitance is charged with a voltage which has a magnitude within a range corresponding to half of the least signification bit with respect to a desired grayscale voltage value to be supplied to the electro-optical element and which has a magnitude of 90% or more of the desired grayscale voltage value.

12. (Original): An electronic instrument comprising the electro-optical device as defined in claim 8.

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13. (Original): A voltage supplying device which supplies a voltage to a load capacitance to finish charging the load capacitance with a predetermined voltage within a predetermined charging period, the voltage supplying device comprising:

a reference voltage generating circuit having a ladder resistance circuit to which at least M resisters are connected in series, which outputs (M–1) voltages divided in the ladder resistance circuit as (M–1) gamma-corrected reference voltages;

a reference voltage supplying circuit connected to N resisters among the M resisters (where N < M), which selects and supplies one of N external reference voltages and N resistance divided reference voltages to the reference voltage generating circuit;

N first impedance conversion circuits which perform impedance conversion on the N resistance divided reference voltages from the reference voltage supplying circuit and output the converted voltages;

a voltage selection circuit having a plurality of analogue switches one of which is turned on based on grayscale data, which selects one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

a second impedance conversion circuit which performs impedance conversion on a voltage from the voltage selection circuit and outputs the converted voltage;

a first switching element connected between the first impedance conversion circuit and the load capacitance;

a first bypass line for shorting input and output lines of the first impedance conversion circuit;

a second switching element provided on the first bypass line;

N third switching elements connected between the N first impedance conversion circuits and the reference voltage generating circuit;

N second bypass lines for shorting input and output lines of the respective N first impedance conversion circuits; and

N fourth switching elements provided on the respective N second bypass lines,

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wherein the first switching element is turned on and the second switching element is turned off in the first period of the charging period, and the first switching element is turned off and the second switching element is turned on in the second period of the charging period which follows after the first period;

wherein when the N external reference voltages are supplied from the reference voltage supplying circuit, the N fourth switching elements are turned on and the N third switching elements are turned off in the first and the second periods; and

wherein when the resistance divided reference voltage is supplied from the reference voltage supplying circuit, the N third switching elements are turned on and the N fourth switching elements are turned off in the first and the second periods.

14. (Original): A semiconductor device comprising the voltage supplying device as defined in claim 13.

Cont

15. (Original): A voltage supplying device which supplies a voltage to a load capacitance to finish charging the load capacitance with a predetermined voltage within a predetermined charging period, the voltage supplying device comprising:

a reference voltage generating circuit having a ladder resistance circuit to which at least M resisters are connected in series, which outputs (M-1) voltages divided in the ladder resistance circuit as (M-1) gamma-corrected reference voltages;

a reference voltage supplying circuit connected to N resisters among the M resisters (where N < M), which selects and supplies one of N external reference voltages and N resistance divided reference voltages to the reference voltage generating circuit;

N first impedance conversion circuits which perform impedance conversion on the N resistance divided reference voltages from the reference voltage supplying circuit and output the converted voltages;

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a voltage selection circuit having a plurality of analogue switches one of which is turned on based on grayscale data, which selects one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

a second impedance conversion circuit which performs impedance conversion on a voltage from the voltage selection circuit and outputs the converted voltage;

a first switching element for blocking an output of the first impedance conversion circuit;

a first bypass line for shorting input and output lines of the first impedance conversion circuit;

a second switching element provided on the first bypass line;

N third switching elements for blocking an output of the N first impedance conversion circuits;

N second bypass lines for shorting input and output lines of the respective N first impedance conversion circuits; and

N fourth switching elements provided on the respective N second bypass lines,

wherein the first switching element is turned on and the second switching element is turned off in the first period of the charging period, and the first switching element is turned off and the second switching element is turned on in the second period of the charging period which follows after the first period;

wherein the N third switching elements are turned on and the N fourth switching elements are turned off in the first and the second periods; and

wherein when the voltages at the output sides of the N first impedance circuits are monitored, the N fourth switching elements are turned on and the N third switching elements are turned off.

16. (Original): A semiconductor device comprising the voltage supplying device as defined in claim 15.

17. (Previously Presented): A voltage supplying device comprising:

a reference voltage generating means having a ladder resistance circuit to which a plurality of resisters are connected in series, for outputting a plurality of voltages divided in the ladder resistance circuit as a plurality of gamma-corrected reference voltages;

a plurality of first impedance conversion circuits which performs impedance conversion on the plurality of reference voltages from the reference voltage generating circuit and outputs the converted voltages;

a voltage selection means having a plurality of analogue switches one of which is turned on based on grayscale data, for selecting one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

a second impedance conversion circuit which performs impedance conversion on a voltage from the voltage selection means and outputs the converted voltage;

a first switching element for blocking an output of the second impedance conversion circuit;

a first bypass line for shorting input and output lines of the second impedance conversion circuit;

a second switching element provided on the first bypass line;

a plurality of third switching elements for blocking an output of the plurality of first impedance conversion circuits;

a plurality of second bypass lines for shorting input and output lines of the respective plurality of first impedance conversion circuits; and

a plurality of fourth switching elements provided on the respective plurality of second bypass lines,

wherein the first switching element is turned on and the second switching element is turned off in a first period of a charging period, and the first switching element is turned off and the second switching element is turned on in a second period of the charging period which follows after the first period; and

wherein the plurality of third switching elements are turned off and the plurality of fourth switching elements are turned on at least in a final stage of the second period, and the plurality of third switching elements are turned on and the plurality of fourth switching elements are turned off in the other periods of the charging period.

18. (Previously Presented): A method for supplying a voltage comprising:

providing a reference voltage generating circuit having a ladder resistance circuit to which a plurality of resisters are connected in series;

outputting a plurality of voltages divided in the ladder resistance circuit as a plurality of gamma-corrected reference voltages;

performing impedance conversion on the plurality of reference voltages from the reference voltage generating circuit and outputting the converted voltages by a plurality of first impedance conversion circuits;

providing a voltage selection circuit having a plurality of analogue switches;

turning on one of the plurality of analogue switches based on grayscale data, which selects one of the plurality of reference voltages from the plurality of first impedance conversion circuits;

performing impedance conversion on a voltage from the voltage selection circuit and outputting the converted voltage by a second impedance conversion circuit;

blocking an output of the second impedance conversion circuit by a first switching element;

shorting input and output lines of the second impedance conversion circuit by a first bypass line;

providing a second switching element provided on the first bypass line;

blocking an output of the plurality of first impedance conversion circuits by a plurality of third switching elements;

shorting input and output lines of the respective plurality of first impedance conversion circuits by a plurality of second bypass lines; and

providing a plurality of fourth switching elements provided on the respective plurality of second bypass lines,

turning on the first switching element and turning off the second switching element in a first period of a charging period, and turning off the first switching element and turning on the second switching element in a second period of the charging period which follows after the first period; and

turning off the plurality of third switching elements and turning on the plurality of fourth switching elements at least in a final stage of the second period, and turning on the plurality of third switching elements and turning off the plurality of fourth switching elements in the other periods of the charging period.

19. (Previously Presented): The method as defined in claim 18 further comprising turning off the plurality of third switching elements and turning on the plurality of fourth switching elements throughout the second period.

20. (Previously Presented): The method as defined in claim 18 further comprising supplying a power source voltage to the plurality of first impedance conversion circuits and turning off a fifth switching circuit in synchronization with an off operation of the third switching element.